

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE  
STATE OF CALIFORNIA**



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Order Instituting Rulemaking Regarding Policies, Procedures and Rules for Development of Distribution Resources Plans Pursuant to Public Utilities Code Section 769.	Rulemaking 14-08-013 (Filed August 14, 2014)
And Related Matters.	Application 15-07-002 Application 15-07-003 Application 15-07-006
<b>(NOT CONSOLIDATED)</b>	
In the Matter of the Application of PacifiCorp (U 901-E) Setting Forth its Distribution Resource Plan Pursuant to Public Utilities Code Section 769.	Application 15-07-005 (Filed July 1, 2015)
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**POST-HEARING COMMENTS OF SOUTHERN CALIFORNIA EDISON COMPANY**  
**(U 338-E) REGARDING TRACK 2 DEMONSTRATION PROJECTS**

ANNA J. VALDBERG  
MATTHEW W. DWYER  
CLAIRE E. TORCHIA

Attorneys for  
SOUTHERN CALIFORNIA EDISON COMPANY

2244 Walnut Grove Avenue  
Post Office Box 800  
Rosemead, California 91770  
Telephone: (626) 302-6945  
Facsimile: (626) 302-2610  
E-mail: Claire.Torchia@sce.com

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**I.**

**INTRODUCTION**

Pursuant to the August 1, 2016 email ruling by Administrative Law Judge Allen and the ruling issued by ALJ Allen during the August 11, 2016 Track 2 evidentiary hearings (“Track 2 Hearings”), Southern California Edison Company (“SCE”) respectfully submits these comments in the foregoing dockets.

In these comments, SCE (a) provides further discussion regarding its proposed communications, monitoring, and control infrastructure to support its proposed Demonstration Project (“Demo”) C; (b) provides further explanation regarding the methods of operational

control that are proposed to be evaluated as part of the Track 2 Demos (Demos C, D and E); and (c) seeks to clarify what equipment will be required for monitoring, communications, and integration functions as part of the Demos, regardless of the method of operational control. These comments also outline SCE's proposed cost recovery process for both costs of Demo implementation and costs of contracts for DER services.

## II.

### **DISCUSSION**

#### **A. The Goals of Demonstration Project C Require Robust Monitoring Infrastructure**

At the Track 2 Hearings, there was substantial discussion concerning SCE's need to monitor the circuits as part of Demo C. The discussion considered SCE's existing capabilities to monitor grid conditions, compared to the augmented monitoring capabilities proposed to be implemented in SCE's Demo C. In this section, SCE provides further explanation regarding the need for enhanced monitoring.

As required by the Final Guidance, SCE developed a proposal for Demo C that seeks to validate the ability of DERs to provide multiple benefits to the grid, and to "either displace or operate in concert with existing infrastructure to provide the defined functions."<sup>1</sup> To effectively demonstrate that DER operations are providing the required attributes to the grid, SCE has structured Demo C to adequately: 1) monitor performance (*e.g.*, resource output, circuit impacts at various points, and overall substation impacts); 2) communicate the data from the various monitoring points to existing grid operation applications; and 3) interface the data to those existing applications and implement new tools that provide visibility over the grid. These capabilities are required to help ensure that the DERs operate safely and provide the expected benefits, including successful deferral of the need for a circuit upgrade.

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<sup>1</sup> See Assigned Commissioner's Ruling on Guidance for Public Utilities Code Section 769 – Distribution Resource Planning, dated February 6, 2015 ("DRP Ruling"), Attachment, Guidance for Section 769 – Distribution Resource Planning ("Final Guidance"), at p. 6.

Relying upon DERs to reduce loading on a circuit adds additional complexity to grid operations and requires visibility into the specific conditions on the circuits. This is because DERs may have varied impacts at different locations on the grid; the combined impact of many DERs on a circuit may create unique and varied local situations in which different segments of the grid are experiencing different voltage conditions and different current flows. A general understanding of the circuit is insufficient: a more granular, real-time situational awareness is required to help ensure that current and voltage remain within prescribed limits on each segment on the circuit.

SCE's current visibility into grid operations is sufficient to reliably operate today's grid, but is insufficient to monitor a grid characterized by many DERs providing services to a distribution circuit. While SCE has access to customer meter information at the single point where the customer interconnects to the distribution grid, this information is not available in real-time. Typically, customer meter data is retrieved once per day. SCE does have access to real-time circuit data at the substation, but readings at the substation do not capture the potentially significant variability in voltage and current at various segments along the circuit. Additional monitoring points between the customer and the substation are required to determine the overall performance and capability of the DERs to achieve the anticipated net benefits.

DERs may be able to provide some information about the condition of the grid at the point of interconnection. However, they cannot provide definitive information about voltage at other points on the circuit. Likewise, the measurements at the DER interconnection point would not offer any information about the current flow on the main line or other branches of the circuit. Because of these limitations, additional monitoring is needed along the circuit to give grid operators the necessary situational awareness of what is happening to avoid voltage problems and equipment overloading.

Thus, SCE has proposed to include equipment and services as part of its Demo C, including monitoring and communications equipment, control systems, and integration services,

which it believes are needed to adequately monitor performance, communicate data, and transfer that data to SCE's grid control systems and operators.<sup>2</sup>

**B. SCE's Track 2 Demonstration Projects Will Evaluate Multiple Methods of Operational Control**

At the Track 2 Hearings, there were questions raised regarding how DERs will be controlled, including whether DERs would respond to dispatch signals sent by SCE or be controlled directly by SCE. As SCE stated during the Track 2 Hearings, both methods of control should be demonstrated.

SCE plans to test the two general methods to monitor and control DERs owned by customers and third-party providers: (1) utility control via direct communication from SCE to the DER device and (2) third-party control, in which third-party aggregators respond to dispatch instructions communicated to them by SCE. Both of these methods will be evaluated to learn their strengths, weaknesses, and costs. While these two methods differ in how the final communications to the DER device is accomplished, they both require the implementation of back-end systems at SCE, which will allow SCE to analyze the current condition of the grid, calculate any needed response from the DERs on each distribution circuit, and communicate this information to SCE operators so the grid can be operated in a safe and reliable manner. To the extent possible, SCE intends to use common communication standards and protocols to simplify the communications of monitoring and control information to multiple DERs and third-party aggregators.

Since these control systems are expected to enable the deferral of infrastructure, it is critical that they provide reliability comparable to the installation of wires and transformers. Through the Track 2 demonstration projects, SCE will test direct control of DERs to determine

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<sup>2</sup> See SCE's July 22, 2016 comments, *Comments of Southern California Edison Company (U 338-E) Regarding Track 2 Demonstration Projects* ("SCE's July 22 Comments"), filed July 22, 2016, at pp. 4-7 and pp. 14-20 (discussing in detail the specific the equipment and services).

whether such control can provide this high level of reliability. SCE will also seek to determine whether control exercised through a third-party provider can also satisfy this level of reliability.

For Demo C, the required level of control has not yet been determined. It will be dictated by the services and performance attributes that will be required to achieve the goals of the Demo and the resources selected to provide those services. Depending on the specific performance attributes that will be required, SCE will determine whether direct control is necessary or whether third-party control (responding to SCE's dispatch signals) is appropriate (or whether both methods may be tested and evaluated).

Demo D will demonstrate the use of SCE's control system to operate multiple DERs in concert and in coordination with third-party DERs on a high penetration circuit.<sup>3</sup> This control system will require all components of monitoring, communications, control, and integration. SCE assumes that for this high penetration to be effectively integrated the level of coordination and interaction with the DERs must be increased relative to current systems. SCE intends to demonstrate both directly-controlled DERs as well as DERs that are responding to dispatch signals sent by SCE. SCE intends to demonstrate effective coordination between utility devices and customer resources and to determine the necessary infrastructure required to support high penetration DER levels.

For Demo E, the control system supports the ability of the utility to operate a microgrid where both utility and third-party resources serve a significant portion of customer load and provide reliability services.<sup>4</sup> The control system will need to manage interconnected and islanded conditions as well as the transition between the two conditions. Because these two conditions have significantly different operating conditions (*e.g.*, circuit protection requirements, load and resource balancing), this control system will be relatively unique and optimized to the microgrid capabilities. SCE has not yet performed the detailed design to determine whether the Demo E system will utilize direct control, dispatch signals, or both.

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<sup>3</sup> See Final Guidance, at p. 7.

<sup>4</sup> See Final Guidance, at p. 7.

**C. Regardless of Which Control Methods Are Implemented, Certain Monitoring, Integration, and Communication Systems Are Needed**

In the Track 2 Hearings, there was substantial discussion concerning the equipment required for control of DERs. Regardless of the method of operational control (e.g., direct control, dispatch signals), equipment and software systems will be required for coordination of DER actions. These systems are necessary to maintain reliable operation of a distribution grid that is not only accommodating high penetration of DERs, but also (in some cases) depending on the performance of DERs to maintain power quality and voltage and defer the need for conventional infrastructure. Managing the grid and DERs under these circumstances requires more granular and faster analysis, decision-making, and control. The systems and equipment proposed in SCE's Demos will provide these necessary capabilities.

A complete system to safely integrate DERs and maximize their value is comprised of monitoring, communications, control software and integration hardware and software. The control software and integration portions of the system are common to whatever method of operational control is used. The control software does not necessarily directly control operation of any particular DER in isolation. Rather, the control software takes in the status of the distribution circuit, as determined by sensors on the circuits and at the substation, the current status and performance of DERs (provided either directly from the devices *or* through a third-party aggregator), and weather data used for predicting DER output. This software then calculates the required actions by the DERs to maintain proper distribution system voltage and power flows. These actions are then communicated to the DERs, either directly from SCE *or* indirectly through third-party aggregators. This control system, and the hardware it runs on, are needed to ensure that all DERs and circuit equipment operations are coordinated, *regardless* of whether SCE is directly controlling the DERs or sending dispatch signals to third-party DER aggregators.

The integration portions of the system coordinate the collection and distribution of data between DERs, control software, existing SCE grid management systems, and the grid system

operators. Since the system inputs and outputs utilize many communications standards and protocols, the integration systems need to convert this data into a form that the control software can read and understand. The integration portions of the system also needs to be able to directly communicate with grid monitoring and control devices and systems, as well as web portals of third-party DER owners and aggregators.

As part of these demonstrations, SCE plans to show how these multiple inputs and outputs can be integrated, without separate integration software for each device or system. This can be accomplished by utilizing communications standards and an integration bus architecture, which communicates data from one application, which publishes the data to the bus, and to another application, which subscribes to the data. To the extent possible, SCE is working to encourage all parties involved in DER operations and control to utilize common communications standards and protocols. As in the case of the control software, the integration system also requires the procurement of reliable computing hardware for its operation.

SCE is developing this control and integration system to be scalable, meaning that it is designed to be implemented across a large service area like SCE's if the system proves successful in the demonstration project. This control and integration system will lay the groundwork for more wide-spread integration of DERs into the distribution system, whether those DERs are directly controlled by SCE, or responding to dispatch signals sent by SCE, or both. These systems will help ensure that the grid continues to deliver safe, reliable power to SCE's customers.

#### **D. SCE Proposes a Reasonable Cost-Recovery Process**

In this section, SCE discusses its proposed cost recovery process for SCE costs of implementation as well as costs of contracts for DERs. In Section 1, SCE proposes a process for approval of the demo projects and associated cost recovery for implementation, with the exception of third-party DER contracts. In Section 2, SCE proposes a process for approving third-party contracts.



## **1. Approval of the Demo Projects and Associated Cost Recovery**

In its July 22 Comments, SCE proposed an updated cost recovery process for all costs other than the costs of third-party DER contracts.<sup>5</sup> Here, SCE reiterates that proposal:

- A Proposed Decision (PD) is issued to approve (or modify and approve) Demo proposals, including approval (or modification) of project scope and location.
- For Demos C and E,<sup>6</sup> the PD would include authorization of Cost Recovery for the Demos through the following process:
  - The decision approving the Demonstration projects would also approve and authorize cost recovery for SCE's O&M expenses.
  - SCE would be directed to file a Tier 2 advice letter to open a DRP Demonstration Balancing Account to record the revenue requirement associated with the demonstration project.
  - Subsequently, on an annual basis, SCE would file a Tier 3 Advice Letter to recover the prior year's under-collected balance.<sup>7</sup>
- Additionally, for each Demo, SCE would be instructed to proceed with detailed design and engineering work, and to submit a detailed implementation plan within 90 days. This implementation plan would include (among other items) a detailed budget for all remaining costs. SCE anticipates being able to identify cost reductions for Demo C and E in the implementation plan by leveraging equipment and services deployed for Demo D.
- Note: for Demos C and E, the design and engineering tasks have costs associated with them (as presented in Section B.1) but are not yet funded. Therefore, a cost-recovery mechanism should be authorized before these tasks begin. If the

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<sup>5</sup> SCE's July 22 Comments, at pp. 24-25.

<sup>6</sup> For SCE's Demo D: no additional cost recovery is required as the entire project is already funded through EPIC (as previously described in the June 17 Comments).

<sup>7</sup> SCE does not plan to enter a forecast of the Demonstration Projects' revenue requirement into rates in advance; therefore, the entirety of each year's revenue requirement will be recovered as an under-collected balance in the following year.

Commission declines to authorize cost recovery for the entire cost of either Demo C or E, the Commission should authorize establishment of a Memorandum Account to track the Design and Engineering costs for Demos C and E. The Commission could then authorize cost recovery for the remaining project costs following submission of the final implementation plan.

## **2. Approval and Cost Recovery for Third-Party Contracts**

In its June 17 Comments, SCE proposed an advice letter for approving third party contracts.<sup>8</sup> Here, SCE updates that proposal to provide additional detail, and to clarify that, as with other procurement activities, SCE intends to consult with an Independent Evaluator and to meet with the Procurement Review Group (PRG)<sup>2</sup> at key points during the process.

The Decision (described in Section 1 above) would authorize SCE to conduct solicitations for DER contracts to meet the needs of the Demo projects. These solicitations would use the following process:

- As part of the implementation plan described above, SCE would provide a description of its RFO(s), including products to be solicited and a schedule for each solicitation.
- With the assistance of an independent evaluator, SCE would select winning bids and enter into contract negotiations.
- SCE would meet with the PRG multiple times during the solicitation, potentially including the following:
  - Discussion of RFO design and valuation methodology

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<sup>8</sup> SCE's June 17 Comments, at pp. 13-14.

<sup>2</sup> The PRG described here is the same PRG convened to review SCE's other procurement activities. Members of the PRG include Commission staff, ORA and eligible non-market participant parties who have executed a nondisclosure agreement. They may request any data regarding the solicitation or valuation process.

- Review of results of valuation and short-list selection
  - Review of final contract selection
- Following execution of contracts, SCE would submit a Tier 3 Advice Letter seeking approval and cost recovery for each contract for DERs.

### **III.**

#### **CONCLUSION**

SCE appreciates the opportunity to provide these post-hearing comments regarding the Track 2 demonstration projects.

Respectfully submitted,

/s/ Claire E. Torchia

By: Claire E. Torchia  
Senior Attorney for  
SOUTHERN CALIFORNIA EDISON  
COMPANY

2244 Walnut Grove Avenue  
Post Office Box 800  
Rosemead, California 91770  
Telephone: (626) 302-6945  
Facsimile: (626) 302-2610  
E-mail: Claire.Torchia@sce.com

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